

**ANNUAL TECHNICAL REPORT  
EL8/2022  
FOR PERIOD 30 JUNE 2023 SINCE GRANTING**

Project Name: Weld River

Report Number: EL8/2020/1

Licensee: Eastern Victoria Gold Exploration Pty Ltd (1503/80 Lorimer St, Docklands, VIC, 3008)

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#### WELD RIVER PROJECT

##### 1. Introduction

EL 8/2020 is located adjacent to the Weld River, 50 km west-southwest of Hobart. The total area is approximately 224 sq km in area.

The licence was originally granted on 4 March 2021 and a work programme amendment (COVID related) was approved on 25 October 2021 which granted effectively a 5-month reprieve from work and expenditure.

Interest in the area in general commenced in the 1920's and 1930's, mining records noting the issuance of two reward claims, one for nickel and one for osmiridium. More recently, the Weld River area was taken up to explore for silica deposits. Prospecting work in the mid-1980's showed that potential existed in the area for gold, PGE's, and nickel. Two joint ventures were formed with Metal Exploration Ltd and Pegasus Gold Australia Ltd which carried out a limited programme of geochemistry and drilling without significant results. In 1995, Sedimentary Holdings NL concluded an agreement with the Forster family, and exploration programmes are continuing as described herein.

##### 2. Geology

###### a. Regional Setting

The regional geology of the tenement area is rather poorly known but comprises an inlier of Precambrian and early Palaeozoic rocks overlain by Permian sediments which are intruded by Jurassic dolerite. On a large scale the Weld River region lies on a prominent northwesterly-trending gravity and topographic linear extending from Port Huon to Macquarie Harbour, parallel in general to the valley of the Weld River to the northwest.

The Precambrian rocks comprise a north-northwest-striking and northeast-dipping sequence of metasediments comprised mainly of dolomite and lesser quartzite of the Weld River Group. These rocks are discordant to a flat-dipping greenstone sequence (*sensu lato*) of primitive origin, including ultramafic and possibly mafic rocks, some intrusive, and with which the mineralisation of the area is associated. The greenstones have a strong affinity with those associated with the Success Creek Group in western Tasmania, and those in the Adamsfield area, the latter being possibly the

northerly extension of the Weld River belt displaced along a fault structure parallel to the Weld River.

The greenstones are spatially associated with a suite of marbles, calc-silicates, skarns, and quartz-clay rocks which strike north-south over about 5 km along its contacts. The package is clearly discordant to the dolomite/quartzite sequence and is overlain by Permian glaciogene conglomerate/tillite units to the east, which are in turn intruded by Jurassic dolerite.

The rock types are unique in Tasmania, the lenses of quartz-clay rock and skarn/calc-silicate exhibiting a diverse suite of unusual silicate and sulphide minerals, fifty of which have been described by Bottrill & Woolley (1996), underlining the complexity of the mineralogy of the region.

The clear discordant relationship of the greenstones/skarns/quartz-clay rocks to the Precambrian dolomites and quartzites suggests that the greenstones represent a slice of obducted deep crustal/mantle material.

###### b. Rock Types

Based on 1:100,000 mapping by the Tasmanian Geological Survey and drill information, the main rock types are described below from west to east:

**Dolomites:** These rocks are considered Precambrian and are exposed in the banks of the Weld River as flat, brown, generally massive, west-dipping fluted outcrops exhibiting occasional stromatolite colonies and thin (0.1 m) beds of microclastic breccia. These rocks comprise the Weld River Group. Dolomitic marble and calc-silicate occur adjacent to the western greenstone contact.

**Greenstones:** The greenstones are well exposed in road cuttings in the south of EL area where they comprise a suite of talcose fragmentals, serpentinite and dolerite. While interpreted as a conglomerate, most of the fragments are strongly elongate and could quite possibly be deformational in origin. These rocks are magnetic and give rise to a ground magnetic anomaly, about 50 m wide and at least 1200 m in length in the grid area. Spinels are common in hand specimen in the rocks of dunitic/peridotitic/pyroxenitic paragenesis. A dolerite/gabbro characterised by brown hornblende is included.

**Quartz-clay rocks:** These rocks are composed of coarse white, red-brown to grey/black quartz, translucent to opaque in character, with a variable, sugary to

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cherty texture occurring as irregular lenses along the eastern contact of the greenstones. They are massive for the most part, but may exhibit fragmental/breccia textures, with coarse crystalline, quartz-lined vughs 10 to 20 mm wide. They are occasionally jasperoidal or hematitic. No structure which could be construed as bedding has been observed, and their coarse grain size and vughy character suggest they are largely the products of hydrothermal activity. Analogies can be drawn with the “jasperoid” at Fortnum, Western Australia, the “listwenite” at Koum, New Caledonia, and the quartzites of the Mountain Chief Mine in the Howqua Valley, Victoria. All of these are auriferous and intimately associated with the silicification of mafic/ultramafic rocks. Petrography and Ni/Cr chemistry suggests that their precursor was both ultramafic and dolomitic in composition. These rocks occur along the eastern contact of the greenstones, are of stubby lensoid geometry, and may be vaguely stratabound by bedding in the calc-silicate/dolomite.

**Calc-silicate:** These rocks are logged as marble in drill cuttings are white to pale green, coarse grained calcite-serpentine, calcite-forsterite-brucite rocks. Accessory talc and siderite are also present. They are interpreted as contact metamorphosed dolomites of the Weld River Group and occur on both the eastern and western contacts of the greenstones.

**Skarn:** These rocks are seen in drill cuttings and as recessive outcrops in the Weld River and have been mapped on the eastern contact of the greenstones for up to 200 m from their contact. They are strongly associated with the quartz-clay rocks, calc-silicates and the greenstones. They are pale grey/green massive-textured rocks, without significant textural variation apart from veining and vague brecciation. Petrographic work characterizes these rocks as quartz-wollastonite-(xonotlite)-diopside-(calcite)-(magnetite) assemblages, with some andraditic garnet and occasionally sulphides. They are interpreted as hydrothermally altered calc-silicate/dolomite.

**Glacigene Conglomerates, Mudstones:** These are fluvoglacial, matrix-supported conglomerates with a variety of clast types reflecting the basement rock types. They are usually soft and clayey in outcrop, but with “silicified” bouldery inclusions, the origin of which is ambiguous. These rocks form a shallow cover to the west and south of the area of the quartz-clay rocks and the greenstones.

**Jurassic dolerite:** These rocks intrude the Permian as sills and the older rocks as dykes and are quite distinctive petrographically from the dolerite included in the greenstone (above).

#### c. Structure

Interpretation of the ground magnetics in gridded area to the south of the Weld river strongly implies a shallow to moderate dip of the magnetic units to the west. However, outcrops in a road cutting and the cross-sections suggest the sequence is locally gently folded. If the Precambrian dips northeast overall and strikes northwesterly and the greenstones dip west, it is evident that bedding in the Precambrian will be discordant to the greenstone contacts. The internal structure of the ultramafics with their strongly elongate fragmental texture, schistosity, and abundant kinking, supports the notion of deformation associated along its contacts, the body itself representing a thrust slice. The ultramafic “conglomerate” is regarded as deformational in origin and a focus of strain in the area.

The mapped coincidence of the calc-silicates, skarns and quartz-clay rocks with the greenstone contact suggests that these rocks are genetically tied to the greenstone contacts and possibly to its emplacement. Moreover, if the skarns and quartzites representing specific rock units within the dolomites, they should plunge parallel to the intersection of the greenstone contacts and bedding, i.e., shallowly north-northwest.

Other structures striking northwesterly can be inferred from the geomorphology and the ground magnetics, however the detail of their distribution and significance is uncertain.

#### 3. Mineralisation

Sulphide-associated mineralisation at Weld River is unusual in assemblage and geological setting. Over fifty mineral species have been described in the area as noted above.

The intensity and scale of the associated alteration of the greenstone and dolomite make recognition of rock types problematical. There are nine different rock types described in the cross-sections and it requires the use of nickel and chromium geochemistry to distinguish skarns from calc-silicates and altered greenstones. Moreover, many rocks intersected in drilling are difficult to identify owing to the abundant presence of smectitic and kaolinitic clay in the near surface zone.

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However, when the nickel and chromium geochemistry are examined, assuming these elements are relatively immobile, it is evident that the following pre-alteration rock types can be identified:

- Those characterized by nickel values >1000 ppm and similar chromium values - easily recognizable in drill chips and outcrop as ultramafic by the presence of talc and spinel.
- A group exhibiting nickel values between 400 and 1000 ppm plus chromium of about the same level commonly logged as skarn or quartz-clay rocks. These may be mafic rocks or silicified ultramafics. They are collectively considered to have been part of the greenstone assemblage but are evidence of their gross alteration.
- Those usually exhibiting nickel and chromium values of <100 ppm. These are mainly the forsteritic marbles described, but skarns may also be present. They are usually easily identifiable in RC chips.
- A group of typically nickel- and chromium-deficient rocks, but with some chromium-rich and nickel-poor varieties logged as quartz-clay rock. They are clearly alteration products but with pre-mineralisation precursors of greenstone and/or dolomite.

The following generalizations can be made regarding the sulphide mineralisation and its relationships:

- The most impressive gold intersections occur in the contact zones of the greenstones with skarn/quartz-clay rock (WRC-7, 8, 9, 11, and 13) or marble (WRC-6, Figure 8). Elevated zinc, arsenic and nickel values commonly occur in association with elevated gold values at such contacts and exhibit concentrations of sulphur-deficient mineral species as such as niccolite, millerite and loellingite.
- Elevated gold values occur over wider intervals (20 m) in the quartz-clay rocks but are generally in the <1 g/t range (FRC-11, FRC-18, Figure 8). Nickel, arsenic, and zinc are normally of background levels (<100 ppm).

Likely these mineralisation types will exhibit different geometries related to the greenstone contact or to its intersection with bedding in the dolomites as described above. These associations are shown in Figure 8.

The gold and base metal mineralisation at Weld River is thought to be of high-level epithermal origin, associated with Ca-metasomatism and silicification which retrogresses dolomite hornfels and replaces certain structural(?) or lithological zones with quartz/silica flooding. Gold and arsenic are introduced, and nickel and zinc redistributed and/or leached from the greenstones and dolomites. A single galena date places the age of the mineralisation in the Cretaceous, and an analogy with the syenitic rocks of the Cygnet area (Figure 6) and their associated gold mineralisation has been drawn. The youthful age for mineralisation is supported by quartz veining in a dolerite in a cutting on Fletchers Road in the south of the grid area which is assumed to be of Jurassic age. In this model the abundant clay, and the silicified inclusions in the basal Permian are interpreted as alteration products, the conglomerates having provided a cap for the hydrothermal system. The source of heat in this model is an undefined buried granitoid/syenitic(?) intrusion. It has been proposed that the Weld River magnetic anomaly is a magnetite-rich skarn surrounding this intrusion, albeit masked by ultramafic rocks. However, all the skarns observed to date are of distal mineralogy. A literature study by Davidson (1997) has drawn somewhat unconvincing analogies with the Carlin district specifically Fortitude in Nevada and Bau in Sarawak, which are large gold and base metal orebodies hosted by skarns and which also exhibit silica/jasperoid lenses. Nevertheless, the mineral assemblages at Weld River do have some features in common with these examples and the analogy is worthy of consideration.

Notwithstanding the origin of the hydrothermal system, the quartz-clay rocks and skarns at Weld River seems to have evolved through two main processes:

- Moderately high-grade contact metamorphism to form hornfels from Weld River Group giving rise to dolomitic marble, and calcite-forsterite and forsterite-diopside-spinel assemblages.
- Retrogression and hydrothermal alteration to produce the unmineralized serpentine- and brucite-marbles from the forsteritic rocks, and the mineralized diopsidic and xonotlitic skarns and quartz-clay rocks from the greenstones and adjacent calc-silicates.

Nickel mineralisation seems to form preferentially along the contacts of the greenstones and its host is a silicified variety thereof. Gold and arsenic occur preferentially within the quartz-clay rocks and the skarns.

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They occur adjacent to or across the greenstone contact but may be ultimately associated with specific beds of optimal paragenesis in the adjacent dolomites. The quartz-clay rocks occur as lenses along the greenstone contact but also are associated with skarn occurrence. The only identifiable source of heat is the intrusions of “lamprophyric” dolerite of Bottrill and Woolley (1996). These rocks are spatially related to the greenstones and have been interpreted as akin to the undersaturated intrusions of the Cygnet area, which are Cretaceous in age.

**4. Exploration Potential, Proposed Work**

The exploration programmes carried out by Sedimentary Holdings on their Forster Project have shown that gold is associated with strong silicification, hydration and carbonation of a suite of dolomites and greenstones. The system is complex and at the present time incompletely understood in terms of its structure and ore genesis. About 1 km of strike length has been drilled to shallow depths and several significant gold and nickel intersections have been made which now do not constitute a resource but which do indicate that a large gold and base metal mineralizing system exists in the area. The occurrences of gold and nickel mineralisation are of considerable economic interest and can be compared with areas of dolomite- and greenstone-associated mineralisation elsewhere.

The geometry of the skarns and quartz-clay rocks is most likely controlled by the intersection of bedding and the greenstone contact, and individual lenses should plunge to the north-northwest. This geometry has not been specifically tested in the drilling programme to date.

In addition to the area explored to date to the south of the Weld River, a further 3 km of unexplored but similar geology exists to its north, and a presently undefined extension exists to the south probably under shallow Permian cover.

However, the expansion of the National Park boundary since the drilling programmes of the 1990’s has effectively alienated the potential of the gold and base metal potential described above, restricting potential to the south of the EL area where a magnetic anomaly along strike from the mineralised zone is present. The focus the programme will seek to define this anomaly with geochemistry and geophysics and may lead to drilling in due course. No fieldwork has been carried out in the reporting period.

**5. Conclusions**

- 1) The Weld River project encompasses a large hydrothermal system of grossly altered greenstones and dolomitic rocks. These rocks host significant concentrations of gold and base metal mineralisation, which are at an early stage of definition.
- 2) The age and origin of the mineralisation is contentious. However, it is spatially related to the contact of the greenstone unit, it may be distal to a yet unidentified acid intrusion of Cretaceous age. The geometry of individual mineralized bodies is controlled by the intersection of the lower greenstone contact and bedding in the enclosing dolomites, hence will occur as shallowly north-plunging shoots.
- 3) Nickel mineralisation is structurally related to the greenstone contact. Gold-arsenic mineralisation occurs preferentially within adjacent skarns and quartz-clay alteration zones.
- 4) Potential to define an economic resource of gold and/or nickel is evident along the greenstone contact. Only one quarter of the potential strike length has been examined to date. However, the movement in the National Park Boundary has effectively alienated potential in the area drilled by Sedimentary Holdings in the 1990’s. Future exploration will investigate a magnetic anomaly along trend in the southern part of the EL area with geochemistry and geophysics.

**Expenditure**

Labour (2x resources): \$100,000

Other: \$15,440

**Total: \$115,440**

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